# UNITED STATES PATENT AND TRADEMARK OFFICE

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| 10/678,280 | 10/03/2003 | Raghunath Balakrishna | 1014-069US01/JNP-0311 | 3481 |

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SHUMAKER & SIEFFERT, P.A
1625 RADIO DRIVE , SUITE 300
WOODBURY, MN 55125

| EXAMINER |
|---|
| CLOUD, JOIYA M |

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

pairdocketing@ssiplaw.com

<table>
<tr><td rowspan="3"><b>Office Action Summary</b></td><td><b>Application No.</b></td><td><b>Applicant(s)</b></td><td></td></tr>
<tr><td>10/678,280</td><td>BALAKRISHNA ET AL.</td><td></td></tr>
<tr><td><b>Examiner</b></td><td><b>Art Unit</b></td><td></td></tr>
<tr><td></td><td>Joiya M. Cloud</td><td>2444</td><td></td></tr>
</table>

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on <u>18 May 2009</u>.

2a)☒ This action is FINAL.      2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) <u>1,2,7-27,31-51,54 and 56-59</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1, 2, 7-27, 31-51, 54 and 56-59</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

## *DETAILED ACTION*

This action is responsive to the communication filed on 05/18/2009. Claims 1, 2, 7-27, 31-51, 54 and 56-59 are PENDING. Applicant's arguments have been carefully considered but are not persuasive.

## *Response to Arguments*

A)     Ho, as discussed below, makes no mention of how information is replicated between the Ho active and standby cards, and instead the Examiner merely presumes apparently by way of impermissible hindsight that Ho's replication utilizes a temporally-ordered data structure with commit proposal/commit marker pairs. Furthermore, Applicant submits that "Ho therefore lacks any teaching or suggestions concerning replication of this particular data structure, as well as, replicating the commit proposal/commit marker pairs within the data structure.

As to the above arguments A), Examiner respectfully disagrees. Examiner submits further detailed claim mappings, addressing the recited limitations of invention for the purposes of clarifying the rejections made. First, Examiner notes that Ho clearly recites the claim temporally-ordered data structure Secondly, Ho specifically states "replicating the routing protocol state changes..." in col. 4, lines 50-57 and col. 9, lines 9-16, where the state changes are represented in the routing table (temporally-ordered data structure). (See also figure 4b) Furthermore, col. 8, lines 2-27 states a redundancy platform is user to "replicate or copy current configuration information, global information, ***routing table information***, forwarding table information, protocol session information, or database information in the active card to the

standby card." It is therefore, clear that Ho reads upon the limitation of temporally-ordered data structure and wherein communicating the change comprises replicating the temporally-ordered data structure within the standby control unit and replicating the commit proposal and commit marker to the standby control unit, where the commit proposal and commit marker


B)      Ho lacks any teaching to suggest one or more consumers included within the device. According to Applicant's specification a consumer is merely "a process that receives and utilizes state information…" within the router device See paragraph [0006]. Such consumers are clearly taught by Ho, where interior nodes of redundant node can maintain routing state information and represent routers that are used to forward information (col. 5, lines 49-56).

C)      "Applicant notes that claim 1 has also been amended to require that at least one of the consumers comprises a forwarding component." Moreover, Applicant argues "...nothing in Ho suggests that the forwarding component receives any state information from either the active or standby control units, much less receive the portion of forwarding information identified by the commit proposal/commit marker pairs of the temporally-ordered data structure." "A forwarding table is substantially different from a forwarding component."

        As to the above argument C), Examiner respectfully disagrees. Examiner submits that a forwarding table can be reasonably construed as a forwarding component, as nowhere in the claim does the Applicant provide an explicit definition for a *forwarding component*. Thus, Examiner has broadly interpreted the table as a component (see col. 1, lines 29-33, the forward information table (FIB)). If Applicant intends for the forwarding component to be limited by specific functionality of characteristics (e.g. hardware component), then Examiner suggests

Applicant amend the claim language to recite Applicant's intended invention. Likewise,

Applicant's claim language provides no limiting effect on what the "portion of state information"

refers to, but merely exemplifies "a portion of state information" in paragraph [0039] of the

instant specification

> **[0039] Both primary operating system 24 and standby operating system 26 maintain state information as state data 38 and 40, respectively. A portion of state data 38 and 40 may, for example, represent the current state of the interface between router 6A and the network, which may include the current configuration of forwarding component 12. State data 38 and 40 may comprise hierarchically-ordered and temporally-linked data structures.**

Thus, Examiner has broadly interpreted the portion of state information identified by the

respective one of the commit proposal and commit marker pairs to be the status information

indicating acknowledgments for successful updates. And where the commit proposal and

commit marker are the standby card commit message and the active card commit message,

respectively **(col. 13, lines 23-39 and Figure 14)**.

Further arguments made by Applicant rely upon the fallibility of the above arguments A),

B) and C), therefore refer to above response to arguments.


### *Claim Rejections - 35 USC § 102*


The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

**Claims** 1, 2, 7-27, 31-51, 54 and 56-59 are rejected under 35 U.S.C. 102(e) as being

anticipated by Ho et al **(US Patent No. 6,910,148).**

**As per claim 1,** Ho teaches a method comprising managing state information within a

primary control unit included within a device, wherein the state information comprises

information representing a current state of one or more consumers included within the device,

wherein managing the state information comprises (i) managing the state information within a

temporally-ordered data structure, (ii) utilizing, for each of the consumers, a commit proposal

and commit marker pair within the temporally-ordered data structure to identify a portion of the

state information for each of the consumers and (iii) setting, for each of the consumers, the

corresponding one of the commit markers to identify a most recent object of the temporally-

ordered data structure that has been communicated to and for which an acknowledgement has

been received from the respective one of the consumers; **(col. 4, lines 48-51, col. 8, lines 20-27);**

receiving with the primary control unit **(where the active controller system is the primary**

**control unit)** a change to the state information **(the active controller system receives a state**

**change, col. 4, lines 48-51);** prior to communicating the change to the consumer of the state

information included within the device, communicating to a standby control unit included within

the device the change performed by the primary control unit to the state information to

synchronization the state information between the primary and standby control units, wherein

communicating the change to the standby control unit comprises (i) replicating the temporally-

ordered data structure within the standby control unit and (ii) replicating the commit proposal

and the commit marker to the standby control unit; **(where the state change is replicated to the**

**standby controller system, col. 4, lines 48-51, col. 8, lines 20-27); and after synchronizing the**

state information between the primary and standby control units, communicating, with the
primary control unit, the change to at least one of the consumers to update consumer state
information maintained within the at least one of the consumers in accordance with the portion
of state information identified by the respective one of the commit proposal and commit marker
pairs of temporally-ordered data structure, wherein at least one of the consumers comprises a
forwarding component of the device. **(col. 20, lines 40-65)**

 **As per claim 2**, Ho teaches wherein communicating change to the state information to
the standby control unit comprises communicating the change to the state information in
accordance with an order that requires the change to be communicated to the standby control unit
prior to communicating the change to the consumer of the state information **(col. 4, lines 48-51,
col. 8, lines 20-27)**.

 **As per claim 3**, Ho teaches wherein managing state information comprises managing
state information within a temporally-ordered data structure **(routing tables)**, and wherein
communicating the change to the standby control unit comprises replicating the temporally-
ordered data structure within the standby control unit **(col. 4, lines 48-51 and col. 8, lines 22-
27)**.

 **As per claim 4**, Ho teaches wherein communicating the change to the consumer
comprises communicating the change to the state information to the consumer in accordance
with the data structure **(col. 20, lines 45-48)**.

 **As per claim 5**, Ho teaches wherein managing the state information comprises utilizing a
commit proposal and a commit marker to identify a portion of the state information **(col. 11,
lines 11-49)**.

**As per claim 6**, Ho teaches wherein utilizing the commit proposal and the commit marker comprises: setting the commit proposal to identify a most recent object of the temporally-ordered data structure that has been communicated to the consumer **(col. 12, lines 1-5)**; and setting the commit marker to identify a most recent object of the temporally-ordered data structure that has been communicated to the consumer and for which an acknowledgement has been received from the consumer **(col. 12, lines 34-38)**.

**As per claim 7**, Ho teaches further comprising setting a flag that indicates to the consumer that the commit proposal has been set **(col. 12, lines 1-5)**.

**As per claim 8**, Ho teaches further comprising resetting the commit marker to the object identified by the commit proposal in response to receiving the acknowledgement **(col. 11, lines 11-49)**.

**As per claim 9**, Ho teaches wherein replicating the temporally-ordered data structure comprises communicating a portion of the replicated temporally-ordered data structure that is bounded by the replicated commit proposal and the replicated commit marker to the consumer from the standby control unit in the event the primary control unit fails **(col. 11, lines 11-49)**.

**As per claim 10**, Ho teaches, further comprising issuing a communication from the primary control unit to cause the standby control unit to set the replicated commit proposal to identify a most recent object of the replicated temporally-ordered data structure that has not been acknowledged by the consumer **(col. 11, lines 11-49)**.

**As per claim 11**, Ho teaches issuing another a communication from the primary control unit to cause the standby control unit to set the replicated commit marker to identify a most recent object of the replicated temporally-ordered data structure that has been communicated to

the consumer and for which an acknowledgement has been received from the consumer **(col. 11, lines 50-col. 12, lines 1-5)**.

As per claim 12, Ho teaches wherein issuing the other communication to cause the standby control unit to set the replicated commit marker further causes the standby control unit to set the replicated commit marker to the object identified by the replicated commit proposal in response to receiving the acknowledgement **(col. 11, lines 50-col. 12, lines 1-5)**.

As per claim 13, Ho teaches wherein utilizing the commit marker and the commit proposal further comprises deleting a least recent object of the temporally-ordered data structure that is not bounded by the commit marker and the commit proposal **(col. 9, lines 25-30)**.

As per claim 14, Ho teaches wherein managing the state information comprises storing the state information within a set of objects **(col. 23, lines 56-65)**.

As per claim 15, Ho teaches wherein the change comprises on of the plurality of changes, wherein receiving the changes comprises receiving event messages indicating changes to the state information and the method further comprising linking the objects of the data structure in accordance with an order in which the event messages are received to from a temporally-ordered data structure **(col. 29, lines 9-29)**.

As per claim 16, Ho teaches maintain, with a primary control unit of a device, state information within a temporally-ordered data structure, wherein the state information comprises information representing a current state of a consumer included within the device **(col. 4, lines 48-51, col. 8, lines 20-27)**; communicating a portion of the state information that corresponds to a change in the state information to the consumer included within the device so as to update consumer state information maintained by the consumer with the change; and encoding a commit

proposal and a commit marker within the temporally-ordered data structure to identify the

portion of the state information communicated to the consumer **(col. 11, lines 11-49)**.

**As per claim 17**, Ho teaches wherein the data structure comprises a plurality of objects,

and wherein maintaining state information comprises storing the state information within the

objects **(col. 23, lines 56-65)**.

**As per claims 18 and 19**, claims 18 and 19 are substantially the same as 6 and 7 and thus

are rejected using similar rationale.

**As per claim 20**, Ho teaches receiving an update request from the consumer; identifying

a second portion of the temporally-ordered data structure that contains objects more recent than

the object identified by the commit proposal **(col. 11, lines 11-49)**; and communicating state data

associated with the second portion of the temporally- ordered data structure to the consumer in

response to the request **(col. 11, lines 11-49)**.

**As per claim 21**, Ho teaches further comprising updating the commit proposal to identify

the most recent of the identified objects of the temporally-ordered data structure **(col. 11, lines

50-62)**.

**As per claim 22**, Ho teaches receiving an acknowledgement from the consumer **(col. 11,

lines 50-62)**; and updating the commit marker to identify the object identified by the commit

proposal in response to the acknowledgement **(col. 11, lines 50-62)**.

**As per claim 23**, Ho teaches further comprising communicating the change to the state

information to a standby control unit included within the device before communicating the

change to the consumer **(col. 4, lines 48-51, col. 8, lines 20-27).**

   **As per claim 24**, Ho teaches wherein communicating the change to the state information

to the standby control unit comprises communicating the change to the state information in

accordance with an order that requires the changes to be communicated to the standby control

unit prior to communicating the change to the consumer**(col. 4, lines 48-51, col. 8, lines 20-27).**

   **As per claim 25**, Ho teaches wherein the change comprises one change of a plurality of

changes, the method further comprising receiving event messages indicating the changes to the

state information; and linking the objects of the data structure in accordance with an order in

which the event messages are received **(col. 4, lines 48-51, col. 8, lines 20-27)**.

   **As per claims 26-41**, claims 26-41 list substantially the same elements as claims 1-25 but

in device form rather than method form.  Therefore, the rejection to claims 1-25 applies equally

as well to claim 26-41.

   **As per claim 42**, Ho teaches a consumer; a memory to store state information; and a

control unit to maintain the state information within a temporally-ordered data structure, wherein

the control unit communicates a portion of the state information that corresponds to a change in

the state information to the consumer so as to update consumer state information maintained by

the consumer with the change, and encodes a commit proposal and a commit marker within the

data structure to identify the portion of the state information within the temporally-ordered data

structure, and wherein the state information comprises information representing a current state

the consumer included within the device**(col. 4, lines 48-51, col. 8, lines 20-27)**.

   **As per claims 43-50**, claims 43-50 are list all the same elements as claims 1-25 and thus

are rejected using similar rationale.

As per claims **51-55**, claims 53-55 list all of the same elements of claims 1-13 but in computer readable medium form and thus are rejected using the same rationale as used in rejected the method of claims 1-13.

As per claim 56-59, Ho teaches wherein the device comprises a router and wherein the consumer comprises a forwarding component **(Figure 17 and col. 1, lines 33-42).**

*Conclusion*

**THIS ACTION IS MADE FINAL.**  Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action.  In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action.  In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joiya Cloud whose telephone number is 571-270-1146.  The examiner can normally be reached Monday to Friday from on 7:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor,

William Vaughn can be reached on 571-272-3922. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-3922.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published

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for unpublished applications is available through Private PAIR only. For more information

about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access

to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197

(toll-free).


*JMC*

**Art Unit 2444**                          **August 31, 2009**

/William C. Vaughn, Jr./

Supervisory Patent Examiner, Art Unit 2444